Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A sensor apparatus comprising:

two or more sensor devices;

a processing module coupled to each of the sensor devices and configured to process signals received from each of the two or more sensor devices to determine an environmental state; ~~and~~

a communication module that communicates information about the environmental state to a user; and

a pneumatic pump system that provides vapor to the two or more sensor devices to cause the two or more sensor devices to continuously be in an operative state,

wherein the processing module comprises:

a digital signal processing unit that receives and processes signals output from the two or more sensor devices; and

a memory that stores the signals processed by the digital signal processing unit.

2. (Original) The apparatus of claim 1, wherein the processor is configured to execute a first process that detects a change in an environmental condition, and a second process that identifies the origin of the change in the environmental condition.

3. (Original) The apparatus of claim 2, wherein the second process includes a pattern recognition algorithm.

4. (Original) The apparatus of claim 1, wherein the power required to operate the apparatus is less than about 1 milliwatt.

5. (Original) The apparatus of claim 4, further including one of a battery and a solar cell for supplying the power.

6. (Original) The apparatus of claim 4, further including a pick-up antenna, wherein the power is supplied by an external RF field received by the antenna.

7. (Original) The apparatus of claim 1, wherein the communication module includes one of a LED, speaker, buzzer and vibration mechanism.

8. (Original) The apparatus of claim 1, wherein the communication module includes one of a wireless interface device and a physical bus interface.

9. (Original) The apparatus of claim 8, wherein the wireless interface device includes one of an RF transmitter, an RF transceiver, an IR transmitter and an IR transceiver.

10. (Original) The apparatus of claim 8, wherein the physical bus interface includes one of an RS-232 port, a USB port and a Firewire port.

11. (Original) The apparatus of claim 1, wherein at least two of the sensor devices are polymer composite sensors.

12. (Original) The apparatus of claim 1, wherein at least one of the sensor devices is a chemical sensor.

13. (Original) The apparatus of claim 12, wherein the chemical sensor is selected from the group consisting of a polymer composite sensor and a surface modified carbon black sensor.

14. (Original) The apparatus of claim 1, wherein the apparatus has a dimension of less than about 4 square inches.

15. (Original) The apparatus of claim 1, wherein the apparatus has a dimension of less than about 1 square inch.

16. (Original) The apparatus of claim 1, wherein the sensors and the processing module are integrated on a single silicon chip.

17. (Original) The apparatus of claim 1, further including an attachment mechanism for allowing a user to wear the apparatus.

18. (Original) The apparatus of claim 17, wherein the attachment mechanism includes one of a clip and a pin.

19. (Original) The apparatus of claim 1, wherein the processing module is configured to automatically communicate information about the environmental state to an external intelligence module using the communication module.

20. (Original) The apparatus of claim 1, wherein the apparatus is used to diagnose a disease based on sampling the environment of a bodily fluid.

21. (Currently Amended) A wearable sensor device comprising:

a compact housing structure;

an attachment mechanism coupled to the housing structure;

one or more ~~polymer composite~~ sensors;

an alarm module; ~~and~~

a digital signal processor configured to monitor signals from the one or more sensors and provide an alarm activation signal to the alarm module in response to the detection of a threshold condition; and

a power management system configured to operate the sensor device in one of a low power sleep mode and a high power operative mode, wherein the low power sleep mode is enabled for at least 70% of the time that the sensor device is operating,

wherein, during the low power operative mode, the digital signal processor is woken up periodically by a wakeup signal output by the power management system to thereby cause the sensor device to enter the high power operative mode, wherein during the high power operative mode the digital signal processor scans the one or more sensors and determines whether or not an event has occurred or is occurring, and wherein the digital signal processor goes back to an inoperative sleep state and thereby causes the sensor device

to reenter the low power operative mode when the digital signal processor determines that an event has not occurred or is not occurring.

22. (Original) The device of claim 21, further comprising a communication module configured to communicate with an external processor.

23. (Original) The device of claim 22, wherein the communication module includes a wireless transmitter device.

24. (Original) The device of claim 23, wherein the wireless transmitter device includes one of an RF transmitter and an IR transmitter.

25. (Original) The device of claim 21, wherein the attachment mechanism includes one of a clip and a pin for attaching the device to a user.

26. (Currently Amended) An integrated sensor apparatus, comprising:

an array of two or more ~~polymer composite~~ sensors;

a processing module coupled to each of the sensors and configured to process signals received from each of the two or more ~~sensor devices~~ sensors to determine an environmental state; and

a communication module that communicates information about the environmental state to a user; and

a power management system configured to operate the sensor apparatus in one of a low power sleep mode and a high power operative mode, wherein the low power sleep mode is enabled for at least 70% of the time that the sensor apparatus is operating,

wherein, during the low power operative mode, the processing module is woken up periodically by a wakeup signal output by the power management system to thereby cause the sensor apparatus to enter the high power operative mode, wherein during the high power operative mode the processing module scans the two or more sensors and determines whether or not an event has occurred or is occurring, and wherein the processing module goes back to an inoperative sleep state and thereby causes the sensor apparatus to reenter the low

power operative mode when the processing module determines that an event has not occurred or is not occurring.

27. (Original) The apparatus of claim 1, wherein the processor is configured to execute a first process that detects a change in an environmental condition, and a second process that identifies the origin of the change in the environmental condition.

28. (Original) The apparatus of claim 27, further comprising a memory module configured to store various parameters associated with one or more environmental conditions.

29. (Original) The apparatus of claim 28, wherein the memory module further stores algorithms used by the first and second processes.

30. (Original) The apparatus of claim 26, further including a power source selected from the group consisting of a battery, a solar cell, an RF tag module and an IR tag module.

31. (Original) The apparatus of claim 27, wherein the communication module includes a wireless transceiver and wherein the processor is configured to automatically communicate information about environmental conditions with an external intelligence module using the communication module.

32. (Original) The apparatus of claim 27, wherein the communication module includes a physical port interface and wherein the processor is configured to automatically communicate information about environmental conditions with an external intelligence module using the communication module when the physical port interface is connected to a bus interface.

33. (Original) The apparatus of claim 32, wherein the bus interface is one of an RS-232 bus, a USB bus and a Firewire bus.

34. (Original) The apparatus of claim 26, wherein the communication module includes one of an LED, a vibration module and a speaker.

35. (Original) The apparatus of claim 26, wherein the apparatus is implemented in a user-wearable badge.

36. (Currently Amended) A portable sensor apparatus, comprising:

two or more sensor devices;

a processing module coupled to each of the sensor devices and configured to process signals received from each of the two or more sensor devices to determine an environmental state;

a communication module that communicates information about the environmental state to a user; and

a power supply module configured to supply power for the sensor apparatus, and

a pneumatic pump system that provides vapor to the two or more sensor devices to cause the two or more sensor devices to continuously be in an operative state,

wherein the processing module comprises:

a digital signal processing unit that receives and processes signals output from the two or more sensor devices; and

a memory that stores the signals processed by the digital signal processing unit, and

wherein the lifetime of the power supply during continuous operation of the apparatus exceeds two weeks.

37. (Original) The apparatus of claim 36, wherein the lifetime of the power supply during continuous operation of the apparatus exceeds two months.

38. (Original) The apparatus of claim 36, wherein the lifetime of the power supply during continuous operation of the apparatus exceeds two years.

39. (Original) The apparatus of claim 36, further comprising a power management module configured to control power flow from the power supply module to the processor module.

40. (Original) The apparatus of claim 36, wherein the apparatus operates in a passive and continuous manner without user intervention.

41. (Currently Amended) A method of using a wearable badge detector, the badge detector having two or more ~~sensor devices~~ sensors, a processing module coupled to each of the ~~sensor devices~~ sensors and configured to process signals received from each of the two or more ~~sensor devices~~ sensors to determine an environmental state, a communication module that communicates information about the environmental state to a user, and a power supply module for supplying power for the detector, the method comprising:

providing the wearable badge detector to [[a]] the user;

attaching the detector to the user; ~~and~~

activating the detector, wherein once activated, the detector operates passively and continuously in excess of one week without requiring recharging or replacement of the power supply module; and

once activated, operating the detector in one of a low power sleep mode and a high power operative mode, wherein the low power sleep mode is enabled for at least 70% of the time that the sensor apparatus is operating,

the method further comprising:

during the low power operative mode, waking up the processing module periodically by a wakeup signal output by the power supply module to thereby cause the detector to enter the high power operative mode; and

scanning the two or more sensors by the processing module and determining whether or not an event has occurred or is occurring,

wherein the processing module goes back to an inoperative sleep state and thereby causes the detector to reenter the low power operative mode when the processing module determines that an event has not occurred or is not occurring.

42. (Original) The method of claim 41, wherein the two or more sensors include polymer composite sensors.

43. (Original) The method of claim 41, wherein activating includes attaching the power supply module to the detector.

44. (Currently Amended) A portable sensor apparatus, comprising:

two or more sensor devices;

a processing module coupled to each of the sensor devices and configured to process signals received from the two or more sensor devices to determine an environmental state; and

a communication module that communicates information about the environmental state to a user; and

a pneumatic pump system that provides vapor to the two or more sensor devices to cause the two or more sensor devices to continuously be in an operative state,

wherein the processing module comprises:

a digital signal processing unit that receives and processes signals output from the two or more sensor devices; and

a memory that stores the signals processed by the digital signal processing unit, and

wherein the apparatus operates in a passive and continuous manner without user intervention.

45. (Original) The apparatus of claim 44, wherein the processor is configured to execute a first process that detects a change in an environmental condition, and a second process that identifies the origin of the change in the environmental condition.

46. (Original) The apparatus of claim 45, wherein the second process includes a pattern recognition algorithm.

47. (Original) The apparatus of claim 44, further comprising a power supply module configured to supply power for the sensor apparatus, wherein the lifetime of the power supply during continuous operation of the apparatus exceeds two weeks.

48. (Original) The apparatus of claim 44, further including an attachment mechanism for allowing a user to ear the apparatus.

49. (Original) The apparatus of claim 44, wherein the two or more sensors include two or more polymer composite sensors.